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ABSTRACT

This workshop collection contains a paper which analyzes the actual and potential income and wealth sources of rural inhabitants, an appendix which discusses the effectiveness of current transfer payment programs in reaching the rural poor, and a reviewer's comments. The paper by Emery Castle and Mark Goldstein describes incomes of rural residents in terms of natural resource endowments, natural resource policies, and aggregate economic activity. Also discussed are necessary conditions for effective public policies, and research issues. Findings indicate that rural areas are inhabited mainly by nonfarmers and that the cost of living declines with the size of the community, that primary industries have provided a declining percentage of employment, that public policy results are mixed, and that the welfare of rural people is closely associated with aggregate economic activity. Goldstein's appendix indicates that many of the current transfer programs only account for the demographic differences between rural and urban poor excluding many rural residents and that any program reforms should account for those differences. Philip Raup's comments applaud the paper's breadth, but suggest a few areas which could be expanded upon, including the entry of rural America into the world market, the low rate of net social return from efforts at large-scale resource development, and others. (PM)

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Rural Development, Poverty, and Natural Resources
Workshop Paper Series

Part II

Income Distribution, Poverty, Natural Resources, and Public Policies: Conceptual and Research Issues

Emery N. Castle and Mark Goldstein
with comments by Philip M. Raup

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PREFACE

In the summer of 1983, with a grant from the Ford Foundation, Resources for the Future convened a workshop on "rural development, poverty, and natural resources." Over forty leading researchers and community development leaders participated in the two-and-a-half day workshop. Workshop discussions were organized around ten commissioned papers, commentators' remarks, and a luncheon address. The papers covered broad issues of rural development, resource ownership and use, and the incidence of poverty and its relationship to natural resources including six case studies focusing on specific resources in various geographic settings.

The workshop papers and the comments on them are available in a six-part series as follows. An overview paper summarizing the key topics and issues discussed will be available in the spring of 1984.

Part I

Sociodemographic and Economic Changes in Rural America, by Kenneth L. Deavers and David L. Brown, Economic Research Service, U.S. Department of Agriculture; with *comments* by Ronald C. Powers, North Central Regional Center for Rural Development, Iowa State University.

Rural Policy: An Independent View, by Edward J. Blakely, Institute of Government Studies, University of California, Berkeley.

Part II

Income Distribution, Poverty, Natural Resources, and Public Policies: Conceptual and Research Issues, by Emery N. Castle and Mark Goldstein, Resources for the Future, Inc.; with *comments* by Philip M. Raup, Department of Agricultural and Applied Economics, University of Minnesota.

Part III

Real Income, Poverty, and Resources, by Irving Hoch, Julie Hewitt, and Vicky Virgin, Resources for the Future, Inc.; with *comments* by Edna Loehman, Department of Agricultural Economics, Purdue University.

Part IV

Ownership Patterns of Natural Resources in Rural America: Implications for Distribution of Wealth and Income, by Marion Clawson, Resources for the Future, Inc.; with *comments* by Robert G. Healy, Conservation Foundation.

Part V

The City House and the Country House: Land-Use Policies and Rural Poverty in the Northeast, by Frank J. Popper, Resources for the Future, Inc.

Coal, Poverty, and Development Policy in Eastern Kentucky, by Cynthia L. Duncan and William A. Duncan, Mountain Association for Community Economic Development.

Development and Management of Forest Resources for Rural Development in the Pacific Northwest, by Joe B. Stevens, Department of Agricultural and Resource Economics, Oregon State University.

Natural and Human Resources: Major Public Policy and Minority Rural Land Ownership, Management, and Use, by T. T. Williams, Richard Morse, and Avery Webber, Tuskegee Institute; with *comments* by Paul Barkley, Department of Agricultural Economics, Washington State University; Brady J. Deaton, Department of Agricultural Economics, Virginia Polytechnic Institute and State University; and Marty Strange, Center for Rural Affairs.

Part VI

Water and Poverty in the Southwest, by Helen Ingram, University of Arizona; F. Lee Brown, University of New Mexico; Gary Weatherford, Santa Clara University; Gil Bonem, the Center for Natural Resource Studies; Steve Mumme, Colorado State University; and Wade Martin, University of New Mexico.

Indian Natural Resource Development: The Impact on Poverty: Overview of Issues, and Proposals for Research by Susan Williams, Fried, Frank, Harris, Shriver and Kampelman; with *comments* by John Folk-Williams, Western Network, and Allen V. Kneese, Resources for the Future, Inc.

The six-part series and the overview paper are available from: the National Center for Food and Agricultural Policy, Resources for the Future, Inc., 1755 Massachusetts Avenue, N.W., Washington, D.C. 20036.

Kenneth R. Farrell, *Director*
National Center for Food and Agricultural Policy

INCOME DISTRIBUTION, POVERTY, NATURAL RESOURCES, AND PUBLIC POLICIES: CONCEPTUAL AND RESEARCH ISSUES

by Emery N. Castle and Mark Goldstein

Introduction

Who inhabits the rural areas and what are the sources, actual and potential, of their income and wealth? It is important that a factual base be laid prior to the development of a conceptual approach to the relationship of natural resources and income distribution. Enormous changes have occurred in the U.S. economy in recent decades and the rural areas, along with the rest of the society, have been affected greatly. Impressions of the rural areas formulated, say, after World War II, do not provide a reliable foundation for the evaluation and development of public policies for the future.

Despite the close historic association of farming and rural America, rural America is not dominantly farm oriented by any of the common measures. Land in farms accounts for only 46.7 percent of rural land in the United States; 55.6 percent excluding Alaska (Frey, 1982, p. 18, this figure does not include forestland). These data make it clear that there is an enormous amount of rural land not used for farming.[1]

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1. It is confusion on this issue that has led to some of the misunderstanding regarding the loss of land available to agriculture by conversion to urban uses. Much of the rural land that has been converted was not and never would have been used for farming. But some people assumed that because it was rural it was being farmed or had potential for farming. Of course, some of the converted land did have such potential but that was not true of much of the converted land about which so much concern has been expressed.

Emery Castle is President and Mark Goldstein is a Research Assistant at Resources for the Future, Inc., Washington, D.C. The authors are appreciative of the suggestions of Kenneth Farrell and Irving Hoch on an earlier draft of this paper.

Table 1. Off-farm Income per Farm Operator Family as a Percentage of Net Farm Income, 1960-78

Sales class ($)	1960-64	1965-69	1970-74	1975-78
Less than 2,500	408	646	857	1,006
2,500 - 4,999	128	261	472	902
5,000 - 9,999	68	130	217	423
10,000 - 19,999	31	54	91	174
20,000 - 39,999	24	30	38	66
40,000 and over	17	22	17	25
40,000 - 99,999	NA	23	21	30
100,000 and over	NA	20	14	21
All Farms	89	115	104	141

Note: NA = not available.

Source: United States Department of Agriculture, A Time to Choose, January 1981, p. 45.

By 1981, 6.8 percent of the rural population resided on farms as contrasted to 28.3 percent in 1960 (U.S. Department of Commerce, 1981, p. 12 and 1961, p. 3). Excluding Alaska and Hawaii, the number of counties receiving more than 20 percent of their labor and proprietor's income from farming declined from 2,016 in 1950 to 684 in 1975-77 (Hoppe, 1981). Even those who reside on farms are obtaining an increasing percentage of their income from off-farm sources. Table 1 illustrates that the proportion of off-farm income to net farm income has increased dramatically over the last twenty years. This increase has been especially prevalent in farms with yearly sales of less than $40,000 per year.

There is, of course, the danger that the decline in the relative importance of agriculture could be exaggerated. Many rural businesses are dependent on agriculture either by selling farming supplies and household goods to farmers or by marketing the products that come from the farms of the nation. Hoppe has summarized studies of multipliers of the value of farm output. A range of 1.5 to 2.5 would encompass most of the estimates. Nonagricultural multipliers are generally lower, although not dramatically so.

It seems clear from these data that: (1) farmers and those dependent on farm output for jobs and farm-related business income are a significant but declining part of all rural residents, and (2) it is no longer possible, if indeed it ever was, to affect the incomes of most rural residents significantly through farm markets or farm programs.

Who, then, are the rural residents? Unfortunately, we know far less about them than we would like. Many live in the rural areas even though they derive their income and wealth from urban sources. They may choose to do this either because of preference or because the cost of living may be less in rural than in urban areas. Hoch (1979) has done definitive work on this subject and his conclusions warrant repeating here.

> In previous work examining wages and incomes in metropolitan areas (Hoch 1976, 1977), I found that wage rates for some work increased by about 9 percent per order of magnitude of population size, and that per capita incomes increased by about 16 percent with each magnitude of population size. Both the wage and income differentials showed strong persistence over time. I interpreted the wage differential as a compensatory payment, and the income differential as encompassing both the wage differential and differences in factor mix by size of place. The cost of living, as measured by a conventional market-basket index, increased by roughly 4.5 percent per order of magnitude of population, and the remaining wage differential was explained as the net of bads over goods with population size: pollution and congestion costs net of the benefits of increased specialization, such as greater availability of specialized medical services. (p. 953)

Hoch goes on to say about his work following that reported on above:

> Major conclusions are: (a) wage rates increase with population for rural as well as urban populations; (b) the wage size relation holds for small populations of nonmetropolitan counties, as well as for the large populations of metropolitan areas; (c) the pattern of nonmetropolitan income differentials then ties neatly into that of metropolitan income differentials; (d) the rural turnaround can be interpreted as an equilibrating adjustment, because movements from places of higher to places of lower money wages is consistent with increases in real wages; (e) there is little difference in growth in either population or per capita income between nonmetropolitan areas contiguous to and those not contiguous to metropolitan areas, implying that the observed turnaround is not a statistical artifact of urban sprawl extending beyond metropolitan boundaries; and (f) the rural turnaround seems best viewed as a part of a more general equilibrating process favoring the growth of small relative to large places.

In this same article Hoch also writes:

> It is an appealing hypothesis that minimum disamenities occur in the 10,000 to 25,000 range making that population level "optimal" in terms of preferences; below that point, relative isolation and small size may impose net costs, causing increased wages and incomes as an equilibrating adjustment. But this hypothesis needs intensive testing. (p. 958)

There are numerous people in the rural areas who should be considered blue collar workers and lower level white collar workers. Even though farming and the natural-resource-based industries of mining, forestry, and fishing provide employment, rural industry has grown rapidly and provides a growing market for those who offer their labor as a means for obtaining the income they earn.

The growth of social security, other public transfer programs, as well as private sector pension plans have had an influence on rural areas. Entitlement to these programs is largely independent of location. If Hoch is correct that real income increases, to a point, as size of place decreases, one would expect rural areas to be favored by many who obtain a part or all of their income from such programs.

The rural areas are not without their poor, as clearly seen in table 2, even allowing for cost of living differentials. They have more than their proportionate share of retired poor, more of the poor households in rural areas are headed by men than is true in urban areas, and more of the rural poor are ill or disabled (Hoppe and Getz, 1981). All of America is aging but the rural population is at a more advanced stage of aging.

It is possible to piece together data on income sources, population characteristics, and occupational mix to obtain a general picture of those who inhabit the rural areas, but one aspect that is missing pertains to the wealth of rural residents. Although crude measures exist of the amount of wealth that has been accumulated, very little is known about the way that wealth is distributed by age, income levels, and occupation. Weisbrod and Hansen (1968) have attempted to adjust income by the amount of wealth held by assuming that wealth could be converted into an annuity with the length of the annuity being determined by the life expectancy of the holder

Table 2. Place of Residence of Persons Under Poverty Level: 1981 (Absolute Numbers in Thousands)

	Total	Below Poverty Level	
		Number	Percent of total
Inside metropolitan areas	153612	19347	12.6
Inside central cities	62305	11231	18.0
Outside central cities	91307	8116	8.9
Outside metropolitan areas	73545	12475	17.0

Source: U.S. Department of Commerce, U.S. Census Bureau, Current Population Reports, Money Income and Poverty States of Families and Persons in the United States: 1981, Series P-60, No. 134, p. 26.

of wealth. They concluded that the distribution of well-being becomes less equal when wealth is considered. Carlin and Reinsel (1973) came to a contrary conclusion when the same method was applied to farm families. The reason for the difference was that farm families typically combine their labor and entrepreneurship with significant amounts of capital if they are to be competitive in farming. Furthermore, the amount of net worth tended to increase with age even though income from farming declined after the age of 54. While the Weisbrod-Hansen use of the annuity concept is helpful, it should be considered only as an approximation. Wealth probably cannot be converted into income as easily as the annuity idea would suggest because of the difficulty of predicting life expectancy, and because many parents want to leave their children some part of their accumulation.

Some years ago the senior author of this paper became curious about the way people at varying income levels held their wealth. He conjectured that the percentage of total wealth represented by real estate would decline as wealth increased. He persuaded Hansen to do some research on this subject which was subsequently reported in Ervin, et al (1977). These results supported the conjecture, which was based on reasoning about the investment alternatives available to people at various income levels. People at the lower income level typically hold their wealth in the form of

household furnishings, their automobile, and their home. As income increases, investments in all of these areas will increase also before significant amounts of other wealth forms are acquired. Home ownership has been encouraged in this country and has become increasingly desirable in periods when interest rates did not anticipate inflation rates adequately. On the basis of the empirical work of Hansen, as well as that of Carlin and Reinsel, it seems probable that rural residents at all income levels hold a higher percentage of their wealth in real property than is true of their urban counterparts.

As will be shown later in this paper this is an important consideration for public policy. It is unfortunate that we know so little about the way wealth is held. Not only are the data sparse but such data as are available are becoming obsolete. The studies referred to in the preceding paragraphs are based on data obtained during the 1960s. A high priority should be assigned to remedying this deficiency.

Summary to This Point

The evidence presented to this point permits the following generalizations:

1. Despite the historic importance of agriculture and farming in the United States, the rural areas are inhabited mainly by nonfarmers. In fact, the combined number of families who are directly dependent on the primary industries of farming, mining, forestry, and fishing for their income are a minority of the rural residents.
2. Evidence exists that many people believe their real incomes can be improved by residing in rural areas. Not only does the cost of living decline with declining size of place, but many people apparently believe the amenities of smaller places are greater than are those associated with large concentrations of people.
3. The poor of the rural areas have significantly different characteristics than the urban poor. More of the poor households are headed by men and more are ill or disabled.
4. It is probable that rural residents hold a higher percentage of their wealth in the form of real property than is true of

urban residents. It is also probable that the percentage of wealth represented by real property varies inversely with the amount of net worth, but definitive evidence on these relationships does not exist.

The Incomes of Rural Residents and Natural Resource Endowments

The real income of rural residents may be enhanced in two general ways by the natural resource endowments of rural areas. One way is the contribution natural resources may make to the direct consumption of rural residents such as the food that may be obtained from gardening and farming. The other way is the outlet provided for the capital, labor, or entrepreneurship of the rural resident who engages in the economic activity of providing natural resource services to others. The farmer who sells food and the lumberjack who fells trees that become commercial lumber are examples. In one case the natural resource services are consumed directly by the rural resident; in the other the rural resident is made better off by the income earned through the sale of such services to others.

Historically, natural resources contributed greatly to the real income of rural residents through direct consumption. Much of the food consumed by those on the land was produced by them. Hunting and fishing not only was enjoyed by rural residents but also provided food as well as skins and pelts which had utility. Outdoor recreation was more easily enjoyed by the rural than by the urban resident because of proximity and ease of access. The opportunity to enjoy natural beauty was greater for the rural resident.

Economic development has brought with it a decline in the importance of the consumption of natural resource services relative to the production of natural resource services for sale to others. The income that can be earned by the rural resident through the sale of labor or the investment of capital becomes more attractive to many than the satisfaction derived from direct consumption. Nevertheless, there still is considerable satisfaction derived from the direct consumption of natural resource services. Data are not available on the quantity and value of such consumption but the evidence suggests it is more than trivial. Furthermore, it often can be enjoyed by those of low income. We will return to this point later because it is of significance in the design of programs which may affect the distribution of income in rural areas.

The natural-resource-related industries of farming, mining, forestry, and fishing typically assume considerable importance in the early stages of economic development. As development progresses these activities usually decline in relative importance as manufacturing and the services industries grow. A study of rural America over time is generally consistent with this pattern. But the trends are not uniform. Mining and mineral extraction have become relatively more important in recent years in some areas as energy prices have risen.

What, then, are the prospects that further exploitation of the natural resources can generate significant economic opportunity for the residents of rural areas? The answer will be determined by two major constraints:

1. The relative importance of the natural-resource-related industries in the economies of the rural areas. As can be seen in tables 2 and 3, the combined natural resources industries--farming, mining, forestry, and fishing--provided 16.0 percent of the employment and 8.3 percent of the wage income generated in nonmetropolitan areas in 1980. While increases in demand for specific resource services, such as energy, may temporarily influence the long-run trends, it is improbable that these industries will increase in importance, and even further decline is likely. Except for the contribution of agriculture, there is remarkable similarity in the source of personal income of residents of metropolitan and nonmetropolitan areas. (See Tables 2, 3, 4, 5.)

2. The availability in rural areas of the other inputs necessary for natural resource development. The other inputs required for natural resource development are entrepreneurship, capital, and labor. We know less than we would like about the supply of entrepreneurship. T. W. Schultz believes that investment in human capital can significantly increase the supply of entrepreneurship. There is no reason to believe that rural residents are lacking in their potential or capacity for entrepreneurship. Certainly, farming has its share of outstanding entrepreneurs. The availability of capital is of great importance in natural resource development. Farming is still mainly a business of individual proprietorships. As can be seen in table 6, the capital costs for single farm proprietorship are considerable. Private forests are often classified as industrial and nonindustrial, and even the nonindustrial private forests require substantial capital if significant incomes are to

Table 3 - Total Money Income of Nonmetropolitan and Metropolitan Families: 1979 (Numbers of families in thousands and percent of total)

Income level	Nonmetropolitan		Metropolitan	
	Number	Percent	Number	Percent
Under $1,000	225	1.2	569	1,0
$1,000 to $3,999	892	4.5	2293	3.9
$4,000 to $5,999	1124	5.8	2714	4.6
$6,000 to $8,999	2004	10.3	4969	8,5
$9,000 to $11,999	2138	11.0	5414	9.2
$12,000 to $14,999	2034	10.5	5400	9.2
$15,000 to $19,999	3258	16.7	8768	14.9
$20,000 to $24,999	2686	13.8	8399	14.3
$25,000 and over	5099	26.2	20245	34.4
Total	19460	100.0	58771	100.0

Source: U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey: 1980, Unpublished data.

be earned. The capital cost for a nonindustrial private forest in the southeast in 1979 was approximately $832.00 per acre (deSteiguer, 1982, p. 215, and Moak et al, 1983, pp. 29-31). Fishing has long been characterized by small amounts of capital per fisherman but overinvestment in the aggregate because of freedom of access. As a result, returns to both capital and labor have been low. Exploitation of the fossil fuels requires substantial quantities of capital and often substantial risk. Consequently, the corporate form of economic organization is typical although some coal mining companies are not exceedingly large.

Thus, the opportunities natural resource development provide for the improvement of income for the less advantaged rural resident depend, in a most important way, on the control of property rights to natural resources and the outlet natural resource development provides as a market for labor. Both deserve more extensive discussion.

Property rights in natural resources may be held either by individuals or by groups. For example, American Indians, as a group, may hold property rights in natural resources but these rights, in turn, may be allocated or apportioned among Indians within the group.

Table 4. Employment Characteristics: 1970 and 1980 (Absolute Numbers in Thousands)

Industry Group	1970				1980			
	Metropolitan		Nonmetropolitan		Metropolitan		Nonmetropolitan	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Agriculture, Forestry and Fisheries	805	1.6	2012	8.9	831	1.3	2230	7.6
Mining	246	.49	367	1.6	304	.48	536	1.8
Farmers and Farm Managers	248	.49	1123	5.0	222	.35	1197	4.1
Farm Laborers and Supervisors	285	.56	784	3.5	263	.41	739	2.5
Total Natural Resource Employment Related	1584	3.1	4286	19.0	1620	2.5	4702	16.0
Manufacturing	13793	27.2	5857	26.0	14937	23.4	6837	23.3
Transportation, Communication and Other Public Utilities	3818	7.5	1273	5.6	4470	7.0	1765	6.0
Wholesale Trade	2472	4.9	623	2.8	2999	4.7	799	2.7
Retail Trade	8497	16.8	3504	15.6	10924	17.1	4852	16.5
Finance, Insurance, Real Estate (FIRE)	3143	6.2	672	3.0	4599	7.2	1147	3.9
Business and Repair Services	1892	1.8	451	2.0	2999	4.7	724	2.5
Personal Services	2313	4.6	1087	4.8	2470	3.9	1178	4.0
Entertainment and Recreation	473	.93	128	.57	746	1.8	157	.53
Professional and Related Services	9573	18.9	3651	16.2	14198	22.3	5859	19.9
Public Administration	3135	6.2	989	4.4	3856	6.0	1357	4.6
Total	50693		22521		63818		29377	

Source: 1970 data - U.S. Department of Commerce, Bureau of Census, Social and Economic Characteristics of the Metropolitan and NonMetropolitan Population, 1977 and 1970, Current Population Reports, Special Studies P-23, No. 75, p. 74 and 89. 1980 data - Unpublished data collected by the U.S. Census Bureau for the March 1980 Current Population Survey.

Table 5. Distribution of Personal Income, by Source: 1968, 1975, and 1980

Income Source	Percent Nonmetropolitan			Percent Metropolitan		
	1968	1975	1980	1968	1975	1980
Manufacturing	20.6	17.4	18.2	24.2	19.9	19.5
Government Employment	14.4	13.7	12.4	13.3	13.8	12.0
Property Income	14.2	14.7	17.2	14.2	14.5	15.5
Trade	11.3	10.5	10.2	13.9	13.3	12.9
Agriculture, Forestry, and Fisheries	9.6	9.4	4.9[a]	1.0	1.1	0.8
Services	8.7	8.2	8.9	12.7	13.2	14.4
Transfer Payments	8.4	13.1	13.4	4.6	8.9	8.5
Other[b]	12.8	13.0	14.8[c]	16.2	15.3	16.4[c]
	100.0	100.0	100.0	100.0	100.0	100.0

Source: 1968 and 1975 from Herman Bluestone, "Rural Income Growing and Changing," in Rural Development Perspectives, March 1980, U.S. Department of Agriculture. 1980 data are from telephone conversation on June 9, 1983 with Herman Bluestone. All data were originally derived from unpublished Bureau of Economic Analysis data.

[a] 1980 was a bad year for agriculture.

[b] Includes transportation, communication, and public utilities; finance, insurance, and real estate; contract construction and mining.

[c] Mining accounted for 3.4 percent of total nonmetro income and .8 percent metro income in 1980.

In the United States property rights are defined by state law and administered by state and local governments subject to the U.S. Constitution. This means that state and local governments have a great deal of power over individual property rights. Local communities are discovering that they may be able to influence the kind of economic development they will have by the control they can exercise over the use of land and other natural resources. But this control can be used effectively only if there is some degree of consensus among rural residents about what they want to accomplish and if their objectives are in accord with economic reality.

As was noted earlier, a high proportion of the wealth of rural residents, especially those at the lower wealth levels, probably is held in the

Table 6. Average Capital Requirements for Single Farm Proprietorship with $40,000 Gross Farm Sales, United States, 1976

Type of Farm	1976		
	Farmland Value	Other Capital	Total Capital
		Dollars	
Cash grain	293,643	85,036	378,679
Cotton	299,421	113,086	412,507
Livestock ranch	458,806	113,750	572,556
Vegetable	174,022	72,290	246,312
Fruit and nut	195,762	89,666	285,428

Source: United States Department of Agriculture, Structure Issues of American Agriculture, Economic, Statistics, and Cooperative Service, Agricultural Economic Report 438, November 1979.

form of real property. Except for the larger farmers and some nonindustrial forest land owners, much of this real property was probably acquired, at least in part, as a residence. It is not likely that growth in demand for natural resource services would increase greatly the wealth position of rural residents even though increases in demand for such services are always a positive development for rural areas, but primarily because such developments only increase the demand for labor.

The special problems and opportunities of the American Indians will be developed elsewhere in this workshop. Suffice it to say that the property rights they hold to land, mineral, and water resources may well permit them to tap the future income streams resulting from the economic development of their regions. Yet only in a few cases do they enjoy anything approaching an absolute monopoly. Their success will depend in large part on their ability to judge the nature and pace of economic development and on their skill in bargaining and negotiation. Many, Indians and non-Indians as well, welcome this exercise in self-determination.

Land use control by the local community basically involves specifying how the amenity values of the community will be enjoyed. In most instances

it is a crude tool that can influence the shape of development only in a general way. Outside investment will come into a community because the community has something to offer. This may be an abundance of labor, the existence of fuel or nonfuel minerals, raw materials, or unusual amenity values. Depending on the value of these resources, the local community often can influence the amount and kind of outside investment. However, outside investments will not affect all rural residents in the same way. In many instances the groups in control of local land use regulations, who are also in a position to influence developments in the local infrastructure, enjoy the highest incomes and greatest wealth. Thus, the fact of local autonomy with respect to such matters does not necessarily mean that such local autonomy will be used to the benefit of those at the lower end of the income scale.

As one reflects on the potential of changing the way property rights are held as a means of affecting the distribution of income, the question of economic rent or the return commanded by the ownership of natural resources arises. Although information is not readily available on these returns by class of resource and over time, it is probable that such returns in the aggregate have been declining as a percentage of total income. It would be a mistake, however, to conclude that ownership or claims to the returns commanded by natural resources are of little consequence. The 1970s witnessed tremendous windfall gains accruing to the owners of fossil fuel resources that had potential for development. Local monopolies in the ownership of natural resources may make it possible to exploit the labor or other resources that are not mobile. This exploitation may occur either in the form of lower wages or shifting to labor the cost of cyclical instability.

The greatest economic asset of most rural residents is the labor they can exchange for salary and wages. This labor varies greatly in quality, with those at the lower end of the income scale typically offering relatively unskilled labor. The natural-resource-related industries provide an outlet for some of this unskilled labor; it is not surprising that the lowest incomes are often found among the unskilled workers in agriculture. It has been possible to organize laborers much more successfully in forestry and mining than in agriculture. Even though per hour wages are considerably higher in forestry and in mining than in

agriculture, these industries suffer greatly from cyclical instability and, as noted earlier, they are surpassed in importance by other employment opportunities in rural areas.

Space and Distance

By definition, rural areas are less densely populated than urban. Yet space and distance are often taken for granted when considering the differences between rural and urban areas. In the early 1950s, T. W. Schultz became concerned about poverty in agriculture and set out to provide an explanation for its existence (Schultz, 1953). He advanced the locational matrix hypothesis which captured the attention of many economists and stimulated two decades of intensive research. While the hypothesis may not be the powerful explanatory tool Schultz originally thought it might be, it must be taken into consideration if one is to make use of the literature that exists on rural poverty. Bryant (1966) states the hypothesis as follows:

> Economic development occurs in specific locations in a country and these centers of development are primarily industrial-urban in composition. Input and product markets "work better" near the center of such concentrations than at their peripheries. At any point in time, therefore, the closer a community is to an industrial-urban concentration, and the larger the concentration, the higher is the income level of farmers in the community. (p. 558)

The individual who wishes a comprehensive view of this literature is directed to Parts I, II, and III in Martin (1981). Writing in 1966 Bryant summarized the literature to that time and then extended it significantly by an extensive empirical investigation of cross-sectional regional analysis of intercounty variations in the levels of farmer earnings in 1959. Bryant's conclusions were that the industrial matrix hypothesis worked reasonably well as an explanation of agricultural income east of the Mississippi River. But west of the Mississippi, its explanatory power was faulted, with several reasons being advanced as possible explanations. One was that the hypothesis assumed that industrial-urban complexes were at the geographic center of a region, influencing the product and factor markets in surrounding areas. Bryant speculated that this may fit the eastern

United States much better than it does the western region. In the West, urban centers, at least at that time, were much smaller and farm counties were located at much greater distances from the centers. It was also noted by Bryant that western farmers probably produce more for national markets than do eastern farmers.

In a neglected earlier article, Hathaway (1964) raised even more fundamental questions about the hypothesis. He concluded there was no evidence to suggest that the labor markets worked better near urban areas and that the income differentials favored nonfarm work regardless of location. He further concluded that it was the availability of jobs, given the income differentials that existed, which determined whether or not farmers would leave their agricultural employment. Hathaway believed that local factors could influence the availability of jobs as could the economic progress of the urban areas.

The literature on the locational matrix hypothesis assumed no difference in occupational preferences among farm residents in different locations. Norman and Castle (1967) demonstrated that this might well influence some of the results reported by Hathaway, Bryant, and others. Natural resource characteristics among regions may well differ with respect to the opportunity cost they impose for not adopting the new technology associated with "commercial" agriculture. That is to say, the rural resident who wishes to emphasize self-sufficiency may find the economic penalty for doing so considerably greater in central than in southern Iowa, considerably greater in west central Kansas than in southeast Kansas, and greater on the floor of the Willamette Valley in Oregon than in the foothills surrounding that valley. In other words, those who may not wish to engage in full-time, large-scale commercial farming but who do wish to be rural residents, possibly farming part-time, may find some areas preferable to others. The locational matrix hypothesis denied that natural resource attributes, except for distance, would influence farm income. The implicit assumption was that preferences among rural residents were uniform across regions.

Despite the research that resulted from locational matrix hypothesis, a substantial amount of the geographic variation in income is unexplained. Hoch has demonstrated that preferences probably do play a significant role in explaining income differentials among places of varying size. Addi-

tional research is needed to test the relationship of preferences to the variation in incomes that can be observed among areas with different natural resource characteristics.

Since the intensive two decades of research spawned by the industrial matrix hypothesis in the early 1950s, enormous changes have occurred in the economy and the society of the United States. Writing in 1970, Haren noted that:

> About half of the gains in manufacturing employment (in the 1960s) in the smaller or nonmetropolitan labor market areas, or approximately 20 percent of the national total, stemmed from new plant locations or expansions in entirely and partly rural communities. Among major contributory factors were: (1) progress on the Interstate Highway System, (2) improvements in processing, marketing, and transportation technologies, and (3) increased attractiveness of today's small cities and towns as places to work and live. (p. 431)

In 1979, Lonsdale and Seyler edited a book entitled Nonmetropolitan Industrialization. The preface to this book states:

> Nonmetropolitan industrialization is more than an interesting anomaly or temporary manifestation of the times. It is a widespread movement which has come to play a highly important role in the lives of the 63.8 million Americans (31.4 percent of the nation's total population in 1970) living outside metropolitan areas. Almost six million nonmetropolitan jobs are in manufacturing, substantially more than in agriculture. Manufacturing's share of nonmetropolitan employment is almost on par with that in metropolitan areas. The social and economic changes wrought by this largely post-World War II development are having an effect on the welfare of the entire nation. (p. xi)

A rapid decrease in the real cost of both transportation and communication was associated with the trend just described and probably was a necessary condition for its occurrence. Products and materials could be moved at lower real costs. Improved and lower cost communication favored decentralization in physical location even though such developments probably favored centralized financial and managerial control. No doubt the efforts of many state and local communities to attract industry have played a role in many instances.

Yet, if the rural areas are to benefit from industrialization, they can also expect to bear those costs that are inherent in such activity. It is a rapidly changing, competitive area of activity, subject to influence by national and international trends. A loss in U.S. competitive advantage can increase unemployment in rural areas perhaps as much or more than in central cities, and, of course, industrialization is but one stage of development and successor kinds of economic activity must be identified if incomes are to continue to grow.

The higher energy costs of the 1970s increased the cost of overcoming distance for a part of that decade, but now energy costs are no longer increasing more rapidly than other costs, and the energy efficiency of many forms of transportation has been improved greatly. However, decreasing costs of overcoming distance probably are only a necessary but not a sufficient condition for increased rural industrializtion.

Summary--Incomes of Rural Residents and Natural Resource Endowments

The purpose of this section of the paper has been to examine the relationship of natural resource endowments to the income of rural residents. Each of the decades, at least since World War I, has witnessed a change in this relationship. While the past can be described, it does not follow that the future can be predicted.

Rapid technical change in U.S. agriculture after World War II resulted in a substantial disequilibrium between agriculture and the rest of the economy. Labor was in surplus supply in agriculture, and substantial incentives existed for people to leave agriculture. They did this in unprecedented numbers with substantial out-migration of people from rural areas.

During the 1960s, substantial decentralization of industry occurred and employment in nonmetropolitan areas increased. A significant part of the manufacturing output of the nation now comes from the rural areas. This growth of rural industry has had a significant influence on the agricultural sector. Farmers have had to compete in the labor market more directly with nonfarm businesses. An increasing number of farmers and their families have engaged in off-farm employment.

What do these trends imply with respect to the contribution of natural resources to the incomes and well-being of rural people? It is apparent that the natural-resource-related industries--agriculture, forestry, fisheries, and mining--provide a declining percentage of the economic base. The natural resource component of per capita income generally declines as income increases. Obviously, labor, capital, and entrepreneurship are required for the marketing of natural resource services. In common with other types of economic organizations, the natural resource industries have grown in capital required, and the number of economic opportunities for those with limited capital has declined. Thus, the natural-resource-related industries have not brought great economic opportunity to those in rural areas because of their declining employment base, increased capital requirements, and growth in size of firm.

There are, however, many less direct ways natural resources can influence the welfare of rural residents. The natural environment is an important component of the welfare of most U.S. residents, according to recent opinion surveys. The ability of the rural community to control access to certain natural resources, such as water, may constitute a source of power. The contribution of natural resources to the amenities of an area may also be of significance. Thus, the way property rights to natural resources are distributed between the public and the private sector, as well as within the private sector, can have a significant effect on the distribution of income among rural residents.

Natural Resource Policies and the Incomes of Rural People

The United States has a long tradition of using natural resource policies in an attempt to improve the welfare of rural residents. Clawson's paper documents this point in detail and it is a most understandable approach when one considers that we were a nation of vast land areas with sparse human and capital resources. At the time we became a nation, small, individual proprietorships were the prevailing form of economic organization. It was not until the latter part of the 19th century and during the current century that large corporations became dominant on the economic landscape.

It is always hazardous to speculate about such matters as congressional intent, and this is no less true in the natural resource policy area than in other areas of public policy. But it seems safe to say that multiple objectives have always characterized natural resource policy at the national level. There is evidence that many believed that "putting natural resources to work" would add to the national product. It is quite clear that many programs, such as the Homestead Law and the Reclamation Act, had the creation of economic opportunity as objectives. Conservation and environmental objectives also have been present as motivations for many policies but are often quite difficult to pinpoint, partly because our concepts of what constitutes "conservation" or "environmental protection" are not always agreed upon and may shift over time.

Economists have been prone to evaluate such programs in terms of national economic efficiency and, generally speaking, the programs do not stand up very well when such a criterion is used. But, if Congress has multiple objectives, such an economic efficiency test is an incomplete one. More sophisticated economic analysis has attempted to accommodate possible multiple objectives. (For examples see Gardner, 1966, and Haveman, 1972, and Haveman and Krutilla, 1968.)

We confine ourselves in this paper to that literature that has been concerned with multiple objectives. It is our implicit assumption that a government may, quite legitimately, employ natural resource policies as a means of influencing income distribution or economic opportunity. However, we also assume that most serious people will want to know how effective and efficient government policies are in accomplishing those objectives. That is to say, a policy will not appear in a favorable light from an efficiency standpoint if a very small change in income distribution has resulted from a very expensive policy. A policy will not be judged a failure simply because it falls short of maximizing national income if it seems to be accomplishing other goals that Congress intended it to accomplish.

It may well be that our history led policymakers to expect more from government resource development projects than an analytical view of economic development would suggest. Without question, the Homestead Act and various land grant programs created opportunities in natural resource exploitation and development. The conviction seemed to be that economic opportunity would be created if the ownership of some piece of natural

resources, however small, could be placed in the hands of the willing yeoman. But the United States was also committed to the development of its human capital and made significant investments in education and, more recently, in formal research. An environment favorable to the development and application of new technology also existed. Thus, the discovery of knowledge was quickly translated into technical change by an increasingly literate and technically skilled people. The result was that the primary natural resource industries--agriculture, forestry, mining, fishing, and hunting--became declining industries in the sense that they had excess labor resources. Capital and entrepreneurship were substituted for human and natural resources.

Many resource development programs seemed to have been developed and applied without appreciation of these trends. The Reclamation Program, for example, was undertaken at a time when an agricultural revolution was in the making that made millions of farmers redundant. It is not surprising there were many, many failures in reclamation projects when market forces were imposing a very high toll of casualities in agriculture generally.

The enormous economic change that transformed this nation during the latter half of the last century and the first half of this one resulted in the rapid growth of urban areas and declining population in many rural areas. And in rural areas people did not leave but were bypassed by the economic change in the sense they did not share greatly in its benefits. Such change was often caused by social policy and, in any event, was not caused by forces beyond the control of the individual rural resident. Poverty and exceedingly low incomes prevailed and still prevail in many rural areas.

On the basis of fairness a case can certainly be made for special social programs for rural areas. For example, the special educational programs that have existed in agriculture and which have prepared many young farm people for off-farm employment would seem to be fully justified in view of the socially induced technical change which sweeps through American agriculture. Thus, we do not question the appropriateness of programs designed to improve the incomes or well-being of rural residents. Our concern is with the effectiveness of these programs. Given the role of the primary industries in economic development, the improvement of rural incomes by means of natural resource policies is not simple or easy. It is

not surprising that past programs have sometimes failed to meet their objectives.

Policies Affecting the Availability and Productivity of Natural Resources in Rural Areas

There are numerous government programs that are designed to improve the availability or the productivity of natural resources in rural areas. The Reclamation Program, PL 566 projects, ACP payments, and Corps of Engineers projects provide examples. Water resource development programs have been a government favorite. The basic notion seems to be that if the availability and productivity of this natural resource can be improved, numerous benefits will result. At least three levels of benefits have been advanced as possibly flowing from such projects--the income or the utility of the natural resource user (for example, the irrigator), area or regional development, and national income. We attempt to establish here the major generalizations that can be drawn from the literature by discussing each of the three classes of benefits.

User Benefits. On balance, there is little doubt but that government programs that have enhanced the productivity of natural resources have had the effect of shifting income from the population generally to those who have used the natural resource services flowing from these programs and projects. Generally speaking, such services have been available at a lower cost and have been more abundant than they would have been in the absence of these projects. Furthermore, the services provided to the rest of society by these natural resource users no doubt have been at a lower cost than would have otherwise been the case. For example, the food consumer probably has benefited from government expenditures on reclamation projects. Further, a distinction should be drawn between the user and the owner of the enhanced resource. Most of the value of the increased productivity will eventually go to the owner of the resource in the form of rent.

It is far from clear that the effect on users has been what was intended or desired. For example, while flood control expenditures may reduce the areas flooded, flood damages may increase even as such expenditures occur because the expectations of those who live and invest in

the flood plains become overly optimistic.[2] The availability of land and water in a reclamation project may create an illusion of opportunity. Kimball and Castle (1963), for example, found that the rate of farm failures on a reclamation project in Oregon was approximately twice the rate of farm failures for the state in its entirety. Furthermore, the rate of failure varied immensely with size of farm.

Perhaps one of the major reasons such programs have had perverse user effects is that the requirements for the effective use of natural resource services have not been well understood. The assumption often has been that the provision of natural resource services will create economic opportunity. But the facts are that if such an economic opportunity is to be realized, it will require entrepreneurship, labor, and capital. Entrepreneurship no doubt exists among the disadvantaged, labor is not in short supply even though skilled labor may be, but substantial capital and large-scale organization typically are required. Thus, it is often the larger, better capitalized operations that benefit from government programs; this is why there is often a positive association between government program expenditures and the income of recipients (Gardner, 1966).

Even though natural resource policies have not always redistributed income in accordance with apparent social policy, the question needs to be faced as to whether this necessarily needs to be the case. The authors have access to an unpublished manuscript by the Natural Resources Economics Division, U.S. Department of Agriculture, entitled, "Distributional Impacts of Natural Resource Policy." This is a collection of papers that apply modern analytical techniques to a variety of natural resource policies in an attempt to establish their distributional impacts. At least two generalizations can be drawn from this set of papers:

1. The natural resource policies examined illustrate both progressive and regressive income distribution effects.
2. The application of modern analytical techniques improve our ability to estimate the income distribution effects, both ex post and ex ante, of natural resource policies. However, there is a

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2. Irving Hoch notes this may result from either or both of two effects. In one case, risk in a particular year has been decreased, investment increases but a flood comes eventually and loss results. In the other case, investors misjudge the reduction in risk and are overly optimistic.

great deal yet to be learned and the effects are often counter-intuitive.

There is little evidence on how natural resource policies may have affected the distribution of income between urban and rural residents. Such evidence as is available suggests that urban residents probably have benefited more than rural because so many of those who benefit are located in urban areas. The municipal water supplies and the flood control benefits, for example, tend to be concentrated in the high-density, urban areas. Furthermore, the competitive nature of many rural industries such as agriculture will tend to reduce profits or rents accruing to the owners of natural resources.

Regional Benefits. At a theoretical level, it can be said that there will be no net regional benefits resulting from government natural resource investment programs if there is full employment in the economy. To the extent there is idle capacity, regional benefits from government investment may accrue in some regions that will not be offset by losses in other regions.

Robert Haveman, together with John Krutilla, perhaps has researched this area more thoroughly than any other individual (Haveman, 1972, and Haveman, Krutilla, and Steinberg, 1968). A reading of his research leads one to conclude that water resource development projects made possible by public investment have been of questionable value in creating net regional benefits. In particular cases, net regional or secondary benefits may be created where there is unemployment or idle capacity, but such benefits may be of a temporary nature because excess capacity may have a tendency to become reestablished with the passage of time.

Public investment in natural resource projects is a means of redistributing income among regions when the net regional benefits are nonexistent or when the project fails to add to net national benefits. Tolley (1959) was one of the first researchers to demonstrate the indirect effects of public investment on regional income. At the time of his analysis, Bureau of Reclamation programs had created approximately 6.4 million acres of new land equivalent. Since the Southeast was the region where most of the adjustment to the new land occurred, reclamation had the effect of reducing the demand for the output of southeastern agriculture. In Tolley's words:

> The analysis suggests that main effects of western reclamation have been in the South, where perhaps 480 million dollars worth of production has been displaced. The seriousness with which the exact number is taken is not so important as the conclusion that effects have assuredly been significant. Since 480 million dollars is about five percent of gross farm income in the South, it may be that one farm worker for every twenty remaining in southern agriculture has been displaced by western reclamation. (p. 180)

Public investment in natural resource development also can affect the distribution of income among regions directly (Beattie, Castle, Brown, and Griffin, 1971). Approximately a decade ago massive regional water transfer projects plans were being advanced as a means of meeting the water demands of rapidly growing regions. A hypothetical water transfer project was analyzed that would be neutral with respect to its effect on national income (a benefit-cost ratio of 1.0). Yet, the net regional benefit-cost ratios varied greatly among the four regions analyzed--the area of water destination, the area of water origin, the area through which the water would be transported, and the remainder of the nation. In this case, approximately $1.5 billion were transferred to the area of water destination, most of it coming from the nation generally. The area of water origin had stimulated economic activity benefits offsetting value of water use forgone, while the area through which the water was transferred benefited from the stimulated economic activity. One suspects that water transfer was perceived quite accurately by many who promoted such projects as a means of transferring income and wealth to a particular region. Since the Southwest is an especially rapidly growing and high-income area, such an income transfer undoubtedly would have been quite regressive.

National Benefits. As noted earlier there is a substantial literature dealing with both the theoretical and empirical dimensions of the economic efficiency effects of natural resource investments. This literature is of relevance to this paper to the extent that it suggests whether natural resource investment policies are, on balance, to the nation's economic advantage. If they are, perhaps they can be justified quite independently of their income distribution effects. If they are not, then their effectiveness in accomplishing other objectives may need careful scrutiny. It has been demonstrated, we believe, that the record is very mixed both with respect to individual as well as regional income distribution.

Generally speaking, such investments have not yielded good returns to the nation. To say the same thing another way, national income might well have been higher in the absence of these programs, and it most certainly would have been higher if some projects had not been built. As noted, this is not the sole criterion by which such projects can be judged but it is certainly a relevant criterion. The political pressures have been such that benefit-cost analysis has not been rigorously applied. The constraint on project construction has been the availability of government funds as many more projects are authorized than are built. The words of Rosenberg (1982) when writing about a related but different problem are worth repeating here:

> Thus, the dangers of defining equity in terms of regional dimensions is that it may lead to policies that have very small favorable effects in terms of equity and very substantial negative effects in terms of national efficiency and growth. (p. 32)

Thus, the record is a mixed one at all three levels of benefits--primary beneficiary, regional, and national.

Policies to Change Ownership

There is much current dissatisfaction with the way rights to natural resource wealth are held. The past two decades have seen a large increase in the constraints that federal, state, and local governments have placed on the exercise of private rights to real property. This has had the effect of shifting rights from the private to the public domain, sometimes for the benefit of particular groups. Coincidentally, we have witnessed considerable dissatisfaction with the way public land has been managed, even to the extent that there has been talk of transferring some of this land to private ownership. What, on the surface, seems to be inconsistent may, in fact, be a response to a common set of fundamental forces. Without attempting a thorough explanation of the dissatisfaction with the way property rights are held, some observations can be offered that will be helpful in understanding these seemingly inconsistent policy initiatives.

Foremost among the causal trends has been a shift in the demand for natural resource services. Income growth in the economy has increased the demand for the nonmarket or environmental services flowing from the natural

resources and this has made both public and private lands more valuable. In the case of the private lands, attempts have been made to provide for these environmental services by constraining the exercise of private rights. In the case of the public lands, environmental interests have become much more active in attempting to influence their management. Mention has already been made of the increased demand for energy; land with commercial fossil fuel deposits has become more valuable. A more rapid growth in the demand than in the supply of water resources has made water resources more valuable as well. This growth in demand has had the effect of increasing the actual or potential rent that can be yielded from natural resource ownership, or from the control of property rights in natural resources. Part of the dissatisfaction with the way property rights in natural resources are held, then, may be dissatisfaction with the distribution of the rent from natural resources. It is one thing for the federal government to hold land "nobody wants"; it is quite another for it to hold land that "everybody wants." As long as the environmental goods yielded by natural resources are abundant, there may not be great concern about the private ownership of such lands. But, when they become so scarce that access is being denied many, the public may well intervene to make sure that private land makes certain public goods generally available.

Undoubtedly, there also is considerable concern with the management of many natural resources quite independent of rent distribution. In the case of water, the institutions governing its allocation and use have resulted in widespread inefficiency. Because water development probably cannot occur on the scale that it has in the past, it is not clear that the situation can be improved in many instances short of changing the rules which govern the property rights to water. Specifically, what seems to be needed are rules that will permit markets in water rights to develop. Many have argued that if such a development were to occur, improvements in the efficiency with which water is used might parallel the improvements that have occurred in the efficiency with which energy has been developed and used in the last few years.

Because private rights in real property are under state law and because the control of these rights varies greatly from place to place, it is difficult to generalize about property right policies. While there may well be policy initiatives at the national level that should be considered,

such policies can never substitute for state, regional, and local policies and programs. A very important part of policy analysis in this arena revolves around the sorting out of national, state, and local objectives and adopting tools appropriate to those objectives. Particular interests need to understand the actual or potential control they have of natural resources as a means of influencing future development and of sharing in the fruits of that development. Indian water rights are perhaps the most striking example.

A concrete example of how property rights can be used to influence the course of economic development over time is provided by public policies regarding Yaquina Bay, Oregon (Stoevener, and coauthors, 1972). Some years ago a paper mill was located near the top or land side of the estuary. Had the effluent been allowed to discharge into the estuary, the aquatic life in the estuary would have been threatened. However, the relative values at that time were such that the commercial benefits from the mill far exceeded the recreational benefits that depended upon the aquatic life in the estuary. Yet, the community was able to insist on the imposition of controls to protect the estuary because of the economic advantage to the mill of being in that location. Today, the estuary yields enormous benefits to the community as a result of recreational and scientific developments that depend on the water quality of the estuary. Recreational marinas have increased, recreational fishing has grown, and the Oregon State University Marine Sciences Center is located on the bay.

In addition to the efforts within local communities that operate in an autonomous fashion, there are groups that assist particular local interests, either by influencing the "rules of the game" (property rights) or by taking full advantage of the rules which exist. The Highlander Center and The Mountain Association for Community Economic Development are examples.

Severance taxes on natural resource extraction are a means of changing the distribution of rent that accrues to natural resources. The extent to which severance taxes can be extracted depends on the degree of monopoly the state or other jurisdiction has over the resource in question. Given time, substitute resources will typically be found--at a price--but severance taxes can be levied successfully until the substitute price is reached. But, of course, whether severance taxes will be progressive or regressive will depend on the way the jurisdiction that collects the taxes

distributes the revenues. Such taxes would appear to be a most acceptable way of addressing some of the social problems associated with cyclical and secular decline and other social problems of many communities and people dependent on natural resource extraction activities. However, severance tax revenues are not always so used (Russell, 1982). Other forms of taxes such as capital gains also represent property rights adjustments and have significant effects on many natural-resource-related industries such as agriculture and forestry.

Direct Policies to Improve the Income of Particular Occupational Groups

The United States has had many decades of experience with policies designed to improve the income of particular occupational groups, and foremost among such policies have been the numerous attempts to improve the incomes of farmers. Since farmers are major users of natural resources it is appropriate to review some of this experience here.

At the heart of these programs have been the efforts to support either the price of particular commodities or the incomes of those who produce those commodities. One has to be impressed by the variations on the same theme that have been played since the 1930s. No new symphonies have been played and only a few new movements have been tried. How effective have such programs been and what, if anything, has been learned?

The programs have been successful in transferring income from the general population to those on farms or, more accurately, to those who own agricultural land, but even despite payment constraints, these programs often have been regressive. That is to say, the larger farmers and the land owners have benefited more than those with a lower volume of production or those who do not own farmland. Despite the fact that such programs have been in existence almost continuously since the 1930s, an enormous consolidation of farms has occurred and there has been a very great displacement of farmers.

There is little doubt but that the larger, commercial family farm dominates the thinking and approach of many agriculturalists who administer the numerous farm programs. Farm commodity program benefits are dominantly based on production, and production is associated with size of unit. The prevailing bias in agriculture has been toward production with less concern for the welfare of rural people and rural communities.

One study has found that 85 percent of publicly supported agricultural research was scale neutral in 1979. Of the remaining 15 percent, 7 percent was directed to farms with less than $20,000 of sales, 5 percent to moderate size farms, and 3 percent to farms with sales in excess of $100,000 (Carter, and coauthors, 1981). Even so, concern has been expressed periodically about small farms and reforms have been attempted. During the Carter presidency, Secretary Bergland became very concerned about the possible "big farm bias" of the U.S. Department of Agriculture and there were attempts to identify and remove any such tendencies. Yet, it is far easier to express concern than it is to take effective action. Economies of scale do exist in agriculture, and any attempt to create a system of small farms that would operate with decreasing average costs would unlikely be successful and if successful, would increase the cost of farm output. However, as Tweeten (1983) has noted, small farms do exist and have always been a part of American agriculture. He argues, however, that there are a number of myths about small farms in the United States such as:

1. Small farms provide a higher quality of life to operators and their families than do larger farms.
2. Small farm operators take better care of their soil than do larger farm operators.
3. Small farms are more energy efficient than larger farms.
4. Small farm preservation and encouragement avoids the trauma of outmigration of farm people to cities.
5. Society would be better off if publicly supported research and education were focused on small farms.
6. Federal government programs have hastened the demise of small farms.
7. Small farms provide the social and economic support necessary to maintain the vitality of nearby towns and cities.
8. Preservation of small farms is essential to economic competition because it avoids concentration of production on a few small farms which would practice monopoly pricing and raise food costs. (p. 1037)

Tweeten believes his research has demonstrated that these are, in fact, myths unsupported by evidence.

One attempt to influence farm size has been the 160 acre limitation under Reclamation Law. Martin (1975) notes that economies of size exist in agriculture and that acreage is only one measure of size and argues that when the acreage limitation conflicts with economies of scale, ways will be found to circumvent the limitation. He concludes that a strict enforcement of the limitation will be unlikely to benefit the farm operators but rather:

> The major beneficiaries of the law will not be landless farm workers. They will be Bureau personnel needed for "detection and correction of violations" (Bureau of Reclamation, 1978) and the large corps of lawyers required for the inevitable court challenges. (p. 927)

One is forced to conclude that policies and programs that attempt to establish a particular size of unit in agriculture are likely to be unsuccessful unless such policies are consistent with economies of scale. However, access to the benefits of government programs need not be biased relative to size. Even so, the establishment of small farm units does not appear to be a viable means of creating economic opportunity for a significant number of the rural poor.

The term "economies of scale" is capable of precise definition in economic theory and lends itself to quantitative treatment in economic research but should be interpreted with care for policy purposes. Economy-of-scale studies typically value at market prices all of the inputs used in production including those actually purchased by the farmer as well as those owned by him such as his labor and equity capital. To the extent the farmer is willing, for occupational, life-style, or locational preferences, to have returns amounting to less than market returns on his own assets, economy-of-scale studies based on market return assumption will be misleading. No doubt this is why small farms remain a part of the landscape despite studies suggesting they are not competitive with larger farms.

Having said all of the above, it is important to note that large numbers of farmers have attained a scale of operations beyond that required to essentially minimize cost of production. Some will argue the increased size is a return to the entrepreneurship required to manage the larger

units; others maintain the larger size is caused by public policies that reward size or because of imperfections in the economy. This is an important unresolved issue in public policy.

Transfer Payments

Although transfer payments are not directly related to natural resources, they do affect the incomes of both nonmetropolitan and metropolitan residents. Transfer payments account for a larger share of personal income in nonmetropolitan areas than in metropolitan areas. This is striking given that, on average, metropolitan areas receive larger transfer payments.

It is clear from the recent comparative research on transfer payments (Bawden, 1977; Seninger and Smeeding, 1981; Hoppe and Saupe, 1982) that the disparity in transfer benefits between rural and urban areas, and between regions and states, exists for three principle reasons:

1. Cost of living differences. Recent work by Hoch (1976, 1979) and Hoppe (1979) concludes that it is less expensive to live in smaller places than in larger ones. Federal in-kind payments, such as Medicaid and public housing, are adjusted for price variations simply because the cost of medical services and housing varies both between regions and between rural and urban areas.
2. Demographic differences. There are a number of demographic differences between the metropolitan and nonmetropolitan poverty population: the nonmetropolitan population is made up of a higher percentage of working poor; poor nonmetropolitan families have a higher proportion of two parent households; and the nonmetropolitan poor have a higher proportion of retired and disabled persons. Indeed, retirement benefits are a greater portion of total transfers in nonmetropolitan areas than in metropolitan areas. However, a number of public assistance programs, such as Aid to Families with Dependent Children (AFDC) and General Assistance (GA), exclude poor nonelderly, male-headed households.
3. Organization and funding of individual programs. A number of the major public assistance programs, particularly AFDC and GA, are solely supported or supplemented by each state.

Hoppe and Saupe (1982) and Vinson and Jesberg (1978) found that much of the rural/urban and regional variation in transfer payments, particularly AFDC, was related to the states setting of both program eligibility and benefit level.

These shortcomings in the current system of transfer payments are indeed serious. The subject of reform of these programs has been hotly argued both in academic and political forums. Extensive studies on income maintenance programs in rural areas have been undertaken (Palmer and Pechman, 1978, and Bawden and coauthors, 1976) and have yielded some interesting results. Research is also needed on the current operation of the Food Stamp Program, which since 1977 has operated as a limited income maintenance program, and has since operated with greater effectiveness in rural areas. Indeed, we feel that many parts of the current transfer payment system have not operated effectively in rural areas simply because they do not account for the demographic and socioeconomic differences between the rural and urban poor. The adoption of any welfare reforms should account for these differences. They should particularly account for the nature of the assets and wealth of rural residents. Previously in this paper we have made note of the lack of current research on this subject. An appendix, prepared by the junior author of this paper, provides a more detailed discussion of the effectiveness of transfer payments programs in rural areas.

Human Capital Policies

It is beyond the scope of this paper to provide a comprehensive treatment of human capital programs as a means of improving the incomes of rural people. Yet, the close relationship of human capital programs to many natural resources and occupational programs makes it essential that such programs be treated, even if incompletely. T. W. Schultz has argued in numerous contexts that the capacity to deal with social disequilibria is perhaps the single most valuable tool that can be used in improving an individual's income. Such a statement would not be surprising if applied only to entrepreneurs, but Schultz holds that it carries just as much force for those who have only their labor and individual talents to offer.

Perhaps one of the most striking features of the human capital problem in rural areas is the extreme heterogeneity of rural residents. The

educational needs of black and Hispanic minorities are certainly not those of the part-time farmer who holds a well-paying off-farm job. The educational needs of the young farm person who expects to leave agriculture are far different from those of the middle-aged unemployed factory worker who happens to reside in a rural area.

When the similarity of the rural and urban employment picture is examined, there is a temptation to conclude that the educational needs and human capital problems are no different than those of urban areas. Yet, if the situation is examined in greater depth it becomes clear that significant differences exist. The rural areas spend less on education than urban areas, and special education programs are less prevalent. Low educational attainment levels characterize significant numbers of rural blacks and Hispanics.

Numerous studies provide evidence that society has received a very high rate of return for its investment in agricultural research and education. Huffman (1980) has shown that the payoff comes not only from improved farm incomes but from the improved ability of farm people to sell their services off the farm. He has estimated that increasing farmers' education by one year has raised their off-farm wage rate by 6.7 percent. Moreover, it increases the odds of their obtaining off-farm work by 10 percent and the average days worked off the farm by 9.7 percent.

Yet, there are limitations to the services that are being provided by traditional agricultural educational efforts. Because such services have traditionally been oriented to agriculture it is doubtful that the content of many educational programs is appropriate for those whose occupations will be of a nonfarm nature. Furthermore, the focus of many of these programs remains on farm rather than rural people so that many rural residents are not touched by these programs. Nevertheless, the programs have enormous strengths and the experience that has been acquired ought not to be ignored. Agricultural education programs have afforded long experience in cradle-to-grave education. Education has been made useful and practical in the context of farm management and homemaking and as a result has often kindled an interest in more fundamental areas of inquiry that might not have occurred otherwise.

There is little doubt in the minds of the authors of this paper that human capital development is one of the principal means by which the

welfare of rural residents will be improved. It is much less clear just what kinds of educational effort will best serve this purpose but it is certain that the enormous heterogeneity of the rural population must be taken into consideration. Neither is it clear to what extent human capital formation efforts should be tied to natural resources or natural resource industries. These are, after all, industries which involve only a minority of the rural residents.

Summary of Natural Resource Policies and the Incomes of Rural People

This nation has a long history of using natural-resource-related policies as means of attempting to improve the welfare of rural residents. Some of these programs have attempted to create economic opportunity in rural areas; some have attempted to improve income directly by transferring income among regions or between occupations; some have attempted to do this by improving the quality of the human capital in rural areas.

The record is mixed. In some cases, none of the stated or apparent program objectives has been achieved. When failures have occurred it usually has been because government has tried to work at cross-purposes with economic trends. When there is rapid technical change in agriculture, and when farm consolidation is proceeding apace, it is not clear that opportunity for the creation of new farm units will be realized from land reclamation, for example, unless there is a loss of farm opportunity in other regions or areas. Programs designed to improve farm incomes may be regressive in practice as larger farms are benefited more than the smaller. In any case, because farmers are declining in number, such an occupational program will affect a minority of rural residents.

Yet, there have been successes. Most studies have shown that society receives a high rate of return on its investment in agricultural research and education. There may be other programs that have been successful on a more limited scope. It would be very helpful if such programs were evaluated on a systematic basis so that generalizations might be drawn from their successes and failures. In any event, it does seem clear that the rural areas do have some unique problems that require special attention and treatment.

Aggregate Economic Activity and the Income of Rural People

As table 1 of this paper demonstrates, there is a remarkable similarity between the occupational mix of metropolitan and nonmetropolitan areas. In the main, the nonmetropolitan areas will be affected in a comparable way to the metropolitan areas by aggregate economic activity. There are reasons to believe, however, that certain segments of the rural economy are especially sensitive to economic activity, specifically agriculture, forest products, and energy industries. Changes in aggregate economic activity will be reflected in changes in demand for the products of the primary industries, in costs of production, as well as in changes in the asset values in those industries. Further, the health of the economy obviously will affect the demand for labor in rural areas generally.

Agriculture

The demand for agricultural products has been influenced increasingly in recent years by international trade. International demand is sensitive, of course, to the strength of the dollar and in recent years U.S. agriculture has been affected adversely by the strong dollar that has been one of the consequences of the inflation control program adopted.

The strength of domestic demand for agricultural products does not necessarily coincide with international demand. The international market for agricultural products has its own sources of instability as many countries pursue domestic agricultural policies which transfer instability to the international agricultural markets.

Each phase of the business cycle has a different effect on the agricultural sector. During periods of expansion of the economy generally, agricultural prices may or may not keep pace with increases in the general price level, but prices paid by farmers often increase more rapidly than does the price level generally. If the dollar is strengthened as a means of bringing inflation under control, the international demand for agricultural products is likely to be depressed.

Price level changes may have a major effect on asset values in agriculture (Castle and Hoch, 1982). Most farmers have something less than full equity in their farms. If debt has been acquired at interest rates that do not anticipate price level changes correctly, wealth will be

transferred from borrower to lender or vice versa. During much of the 1970s interest rates were lower than warranted by inflation rates. Many farmers acquired debt during this period by buying land. The value of the debt that was incurred fell with inflation during this period. Demand for land was stimulated as a result of this phenomenon. This was also true of demand for agricultural products (caused in large part by the increase in international demand) and accordingly, land prices rose more rapidly than the general price level. However, it is possible for wealth gains to occur during inflation even if land prices do not increase more rapidly than the price level because of the decreased value of debt.

As this is written, the situation is very different. Currently, real interest rates seem high. Long-term mortgage interest rates are in the 12 percent to 14 percent range and inflation is about 6 percent annually. It seems likely that the interest paid on debt acquired under such circumstances will be sufficient to provide for time preference as well as the decreased value of debt resulting from inflation. Given that agriculture is largely an industry of individual proprietorships, changes in asset values contribute significantly to the wealth position of farmers. The result is that success in farming is often much influenced by a farmer's position in the business cycle.

Forest Products

Forestry is also affected greatly by economic fluctuations. In recent years monetary policy has been increasingly relied on to control inflation. The result has been exceedingly high interest rates as inflation is brought under control. This has had an enormous effect on housing and the forest products industry. Forest products firms suffer during such periods but the labor resource in forestry and housing also bears a significant part of the cost, usually in the form of unemployment. Workers in these fields often have seasonal unemployment in the ordinary course of events. When cyclical unemployment is superimposed on seasonal fluctuations, the cost is often high.

Fossil Fuels

Some of the lower income rural areas in the United States are heavily dependent on coal mining. But the demand for energy is far from stable and

tends to be positively associated with economic activity. Again this industry is organized in such a way that a large part of the instability is borne by labor, often in the form of unemployment. A number of communities dependent either on fuel or nonfuel minerals in the West and elsewhere have been beset by both cyclical and secular decline.

The Rural Areas and Business Cycle Policies

The available evidence suggests that the primary industries of agriculture, forestry, and fossil fuel production bear a disproportionately large part of the instability of business cycles. Those who are concerned about the welfare of those rural residents whose livelihood depends on these industries may logically be concerned about fiscal and monetary policies that contribute to these cycles. It would appear that these industries have much to gain from greater stability in the economy generally.

There has been a populist concern at least since the time of William Jennings Bryant about "hard" or "tight" money. Is this historic concern mistaken, given the above statements about the virtues of economic stability from the standpoint of some rural residents? Unfortunately, this interesting question cannot be answered without equivocation. It was noted earlier that rural residents may hold a disproportionately large percentage of their wealth in the form of real property. If this is the case they also may hold more than their share of debt as compared to others who have comparable asset levels. If so, it would be quite rational for them to have more than the usual concern about tight money and high interest rates.

The United States has long had policies to encourage home ownership. There is some evidence that these historic policies may be changing. If that is the case, the effect of such a change on the rural areas needs to be determined. It is conjectured that home ownership, in general, has provided the person with modest amounts of wealth some financial protection over the course of the business cycle. However, if instability in the economy is to continue to prevail, changes in the mix of assets and liabilities held by rural residents could well make them more vulnerable. This is an area deserving of further research.

Summary of the Paper's Major Findings

1. The rural areas are inhabited mainly by nonfarmers. The occupational characteristics of the metropolitan and nonmetropolitan areas are remarkably similar except that a somewhat higher percentage of the rural population is engaged in the natural-resource-related industries of farming, mining, forestry, and fishing.
2. The cost of living tends to decline with size of place, and many people believe the amenities of smaller places are greater than those associated with large concentrations of people.
3. The primary industries of farming, forestry, mining, and fishing have provided a declining percentage of the employment in rural areas with the passage of time. Nevertheless, the way property rights are distributed between the public and private sector, as well as within the private sector, can have a significant effect on the distribution of income among rural residents.
4. The record is mixed with respect to the success of rural area public policies in achieving their stated objectives. Large, capital-intensive resource development projects have often failed to achieve their stated objectives at the local, regional, and national levels. Farm commodity programs have often benefited the land owner and the larger farmers as displacement of smaller farmers has occurred. Nevertheless, there have been successes. Many human capital programs have yielded handsome social rates of returns, and the reassignment of property rights holds prospect for improving the welfare of some groups.
5. The welfare of rural people, especially those employed in the primary industries, is closely associated with aggregate economic activity. Thus, macroeconomic policies are of legitimate concern to those with an interest in rural development. It probably is not an exaggeration to say that the single most important factor affecting the welfare of

rural residents is the strength of the labor market in rural areas.

Necessary Conditions for Effective Public Policies

It is not the purpose of this paper to specify in detail public policies related to natural resources that would have the potential of improving the incomes of rural residents. Yet, we believe that there are numerous policy lessons that can be learned from the literature we have surveyed on the subject of natural resources and rural development. We have attempted to state these lessons in the form of necessary conditions that need to be met if public policies are to be effective. Even though past or current programs are not having desired or intended effects, it may be possible to learn from such programs so that they can be modified or so that others can be designed that will be more successful. Even though the following list is in no sense exhaustive, it does establish, we believe, some of the considerations that must be faced if public policies are to be effective in improving the incomes of the more economically disadvantaged rural residents.

1. <u>There should be recognition of what rural people have to offer others in society.</u> The principal resource that the lower-income rural people have to offer others in society is their own services. Some are unable to work and for them transfer programs adaptable to the special needs of people in rural areas need to be developed. For those who are able to offer their services there are three general approaches:
   a. <u>Focus on improving the quality of the human agent.</u> It was beyond the scope of this paper to develop this subject in detail, but it is clear that if the quality of human capital can be improved, the economic position of those who offer their services will also improve. Such programs will need to recognize that the human resource in rural areas is far from homogeneous and that learning can occur for much of the typical life span.
   b. <u>Promotion of rigorous economic analysis of the comparative advantage of rural areas</u>. Most rural residents are dependent on jobs for the major part of their income.

The economic welfare of rural people is far more dependent on the job market than it is on the market for such commodities as soybeans, wheat, corn, cattle, or lumber. Yet, not every rural area can be competitive in many forms of economic activity. There needs to be rigorous evaluation of the comparative advantage of rural areas for various forms of economic activity, and then appropriate policies to attract those industries of greatest promise need to be adopted.

c. Consider prospects for mobility. One hesitates to suggest mobility as a means of adjustment in a society which is among the most mobile in history. Yet, many rural areas have an excess of labor resources and few development prospects. Under those circumstances, mobility is suggested. Human capital programs should be designed with this adjustment possibility in mind.

2. There should be recognition of the declining aggregate importance of the natural resource industries in rural areas. It is a tautology to say that natural resources will command a declining percentage of the income of an economy with economic progress. Yet, this truism is sometimes overlooked. The natural-resource-related industries of agriculture, forestry, mining, and fishing are no longer the dominant industries in rural America.

Agriculture is still an industry of individual proprietorships but the capital requirements are high for those farms that produce the bulk of the agricultural output. The numerous smaller farms have become increasingly dependent on off-farm income. In the case of forestry and mining, labor and ownership are often separated but when they are not, capital requirements are usually large.

3. Large, capital-intensive resource development projects by the federal government are becoming less common. Historically, resource development through such agencies as the Bureau of Reclamation and the Corps of Engineers has been a major activity of the U.S. federal government. Partly because of

the competition for government funds and partly because the best sites have been developed, such programs are becoming less attractive.

Future resource development projects will tend to be smaller and more reflective of local conditions. Attention should be given to those features of projects that will serve the direct needs of local residents. For example, it was found that a reclamation project in Washington was regressive in its irrigation impact but progressive in its provision of outdoor recreation (Infanger and Butcher, 1974). Consideration should be given to the possibility of requiring explicit recognition of the distributional impacts of public policies within and between geographic areas.

4. Government programs designed to assist particular industries tend to be regressive in nature. Experience with the commodity programs for U.S. agriculture suggests that such programs often do little to improve the income of the lower income people in the industry. Therefore, rural development programs probably should be organized on a different basis.

   The impacts of alternative macroeconomic policies related to monetary and fiscal affairs on rural residents need to be considered in strategies for rural development. Both the income effects through employment opportunities as well as the wealth effects on rural residents are deserving of attention.

5. Changing demand conditions change the value of the natural resource endowments of many areas or communities. Even though natural resources decline in aggregate economic importance, some communities may experience significant gains in wealth as the demand changes for certain natural resources such as energy. An important part of rural development policy will be a consideration of the structure of property rights so that lower income people will benefit when demand increases but will not bear a disproportionate share of the costs from declines in demand.

6. Consideration should be given to the intelligence-gathering coordinating function of the federal government with respect to the welfare of rural residents and the condition of rural communities. An awareness of conditions often stimulates action at the local, state, or national level. This low-cost set of activities is not being carried out adequately at present and is probably essential to the improvement of public policies.

Research Issues

One of the objectives of this paper is to identify research that would be useful in understanding the relationship between natural resources and the incomes of rural people for the purpose of using that research in improving public policies. Some of the more obvious areas of research that can be deduced from this paper are identified in the following paragraphs. However, other papers given at this workshop have not been studied from this point of view; if they had been, a different or, perhaps, longer list would have been developed:

1. Research on how wealth in rural areas is held by rural residents at different levels of income. Information on this matter is almost nonexistent. Until such information is available, the impact of many public policies cannot be estimated, and when it is available research should be undertaken to evaluate the impact of these policies on the wealth of rural residents.
2. A research problem of great importance relates to the returns or economic rent commanded by natural resources. Not only are the aggregates important, but the amount of rent that is capable of being earned in particular circumstances provides the basis for judging whether a reassignment of property rights holds the potential of increasing income significantly. Geographic areas undoubtedly vary greatly in this respect. Water, for example, may be a very strategic resource in some areas but is sufficiently abundant in others that it will not earn significant economic rent. This area

of research could easily be combined with an assessment of the effectiveness of reassigning property rights as a means of redistributing income. (See item #6 below.)

3. Research is needed on the relationship of natural resource endowments to the income of rural residents, with consideration being given to the life-style, and the locational and occupational preferences of rural people. Although research that has been done has tested certain hypotheses in a comprehensive manner, many questions remain. As long as these questions are unanswered, effectiveness of many public policies will be unknown.
4. Research is needed on the effect of past as well as proposed programs and policies for natural resource development on: (1) net national income, (2) regional or area income, and (3) particular groups of individuals. It is suspected that many programs have been counterproductive or that they have, at least, had many unexpected or unintended effects. Analytical techniques now exist to do more precise evaluations than could have been done in earlier periods.
5. Much more should be known about the consequences of many macroeconomic policies and programs on regions, industry groups within the economy, and on particular groups within industries. We conjecture that the natural-resource-related industries of agriculture, forestry, and mining bear a disproportionate share of cyclical instability. Furthermore, these industries are so organized that unemployment may be a major adjustment or response to such instability. Research on this set of problems is almost nonexistent.
6. Research is needed on the opportunities that communities or small areas have to influence economic development for the benefit of particular groups within the community. To what extent can the "rules of the game" (property rights) be changed for the benefit of particular groups or for the accomplishment of particular objectives, given the fact that alternatives exist for the location of most economic activities? Given the "rules of the game", to what extent can

outcomes be influenced by the participation of particular groups? The past effectiveness of certain groups and the experience of particular communities might well be analyzed.

Appendix

TRANSFER PAYMENTS

by Mark Goldstein

Recent comparative research on transfer payments in metropolitan and nonmetropolitan areas (Bawden, 1977; Vinson and Jesberg, 1978; Smeeding, 1982a and 1982b; Seninger and Smeeding, 1981; Martin and Lane, 1977; Martin, 1977) has provided evidence that the nonmetropolitan poor, particularly in the South, are not receiving the same level of benefits as their metropolitan counterparts. In this section I will briefly discuss this urban-rural disparity in income transfer benefits.

Transfer payments have become an increasingly important source of personal income in the United States. The portion of personal income from transfer payments has grown from 2 percent in 1950 to 13.7 percent in 1977. In nonmetropolitan areas transfer payments accounted for 16.1 percent of personal income, compared to 13.1 percent in metropolitan areas. The above relationship is striking given that, on the average, metropolitan areas receive larger transfer payments.

While it is true that transfer payments come from both the government (for example, social security, unemployment insurance, medicare, and public assistance) and private industry (for example, grants to nonprofit organizations, and uncollectable debts), the public programs are probably far more important in directly affecting the personal incomes of rural residents. The above-listed public transfer payment programs are, in theory, not targeted at any one segment of the population. However, table A-1 clearly shows that a differential exists between transfer payments in metropolitan and nonmetropolitan areas. Table A-1 also indicates that there is some regional variation in transfer programs. These variations can be explained by cost-of-living differences, demogragraphic differences, and by the organization and character of the individual transfer programs.

Table A-1. Per Capita Transfer Payments by Program, Region, and Residence: 1977

(dollars)

Region	All Programs	General Retirement	Specific Employee Retirement	Unemployment Insurance	Public Assistance
Northeast	1,113	563	144	97	145
Metro	1,118	561	141	98	154
Nonmetro	1,080	569	160	88	93
North central	892	496	106	58	92
Metro	888	475	107	60	105
Nonmetro	900	540	101	53	64
South	893	445	169	34	88
Metro	896	431	201	33	78
Nonmetro	886	467	118	36	106
West	1,018	453	193	64	131
Metro	1,037	455	199	65	141
Nonmetro	946	448	168	62	97
U.S. total	965	487	151	60	110
Metro	982	482	161	64	118
Nonmetro	922	499	125	51	90

Source: Hoppe, Robert A., and William E. Saupe, Transfer Payments in Nonmetropolitan Areas, U.S. Department of Agriculture, ERS Staff Report No. AGES820827.

Cost-of-living differences do lead to regional differences in the levels of transfer payments. Federal in-kind payments, such as Medicaid, are adjusted for price variations simply because the cost of medical services varies both regionally and between rural and urban areas. There has been recent work on the proposed policy of varying transfer payments with the cost of living. Hoppe (1979) concluded that the adoption of programs which account for cost-of-living differentials would raise benefits in metropolitan areas and lower benefits in nonmetropolitan areas, particularly in the South. However, these changes would theoretically only equilibrate the benefits from transfer payments with the actual cost of living in different areas.

Demographic differences also explain some of the differences in the types and levels of transfer payments received by poor residents in

metropolitan and nonmetropolitan areas. The age, health, and family status of rural residents will determine which programs are undertaken in rural areas. There are a number of demographic differences between the metropolitan and nonmetropolitan population with respect to poverty: there is a higher percentage of working poor in the nonmetropolitan population; poor nonmetropolitan families have a higher proportion of two-parent households; and, as mentioned, the population of nonmetropolitan poor has a higher proportion of retired and disabled persons. The organization of the current transfer payment programs does not account for these demographic differences. Indeed, as will be discussed below, the organization and funding of particular transfer programs has had a significant effect on the availability and participation of rural residents.

Public transfer programs fall into two broad categories: retirement programs and income maintenance. Within these two categories is a range of programs directed at improving people's standard of living.

Retirement Programs

These programs pay benefits to disabled workers and survivors of deceased workers in addition to retired workers. General retirement programs, such as Social Security and Medicare, cover workers in a range of occupations. Other specific retirement programs cover employees in specific fields (for example, railroad and government workers). As can be seen in table A-2, retirement programs account for approximately two-thirds of the transfer payments in the United States. It is important to note that both Social Security and Medicare payments in nonmetropolitan areas are a greater share of total transfer payments than in metropolitan areas. This would be consistent with the greater average age of nonmetropolitan residents.

Table A-2. Percentage of Total Transfer Payments Provided by Each Program, by Area of Residence, 1977

Transfer Program	Percent of Total Transfers		
	Metro.	Nonmetro.	U.S. Total
Retirement and related programs	65.5	67.7	66.0
General programs	49.1	54.1	50.4
Social security	38.3	44.4	39.9
Medicare	10.8	9.8	10.5
Specific employee programs	16.4	13.5	15.6
Railroad	1.7	2.2	1.8
Federal	5.1	3.9	4.8
Military	4.3	3.5	4.1
State and local government	5.4	3.8	5.0
Income maintenance	18.5	15.3	17.7
Unemployment insurance	6.5	5.5	6.3
Public assistance	12.0	9.8	11.4
Supplemental security income	2.9	3.6	3.1
Aid to families with dependent children	5.8	3.1	5.1
General assistance	.7	.2	.6
Food stamps	2.0	2.2	2.1
Other	.6	.7	.6
Miscellaneous	16.0	17.0	16.3
Total	100.0	100.0	100.0

Source: Hoppe, Robert A., and William E. Saupe, Transfer Payments in Nonmetropolitan Areas, U.S. Department of Agriculture, ERS Staff No. AGES820827.

Income Maintenance Programs

These programs are aimed at people undergoing economic hardships. They include unemployment insurance and public assistance. Under the subcategory of public assistance are found the well-known public transfer programs. These include Supplemental Security Income (SSI), Aid to Families with Dependent Children (AFDC), General Assistance (GA), and Food Stamps (FS). The amount of these payments in nonmetropolitan areas is often affected by the funding and organization of the transfer program.

Supplemental Security Income (SSI). Established in 1972 this program brings additional benefits to the aged, blind, and retired. A uniform

national benefit floor is set by the federal government, but states may supplement this basic amount. However, Vinson and Jesberg of the National Rural Center (1978) conclude that the pattern of these state supplements does not always correspond with the demographic location of the nonmetropolitan population.

Aid to Families with Dependent Children (AFDC). AFDC provides cash benefits to poor, single parent families. Federal and state governments share the costs of the program. However, individual states set both the benefit and eligibility levels, so benefits from AFDC vary among states. In some states families with unemployed fathers also receive benefits (this program is known as AFDC-UF).

Hoppe and Saupe (1982) found that demographic differences could not explain the differential in AFDC payments between the South and the rest of the U.S. They state:

> Demographic data, however, do not explain why AFDC ranked so low in the South. Both the metro and nonmetro South had a large AFDC target population. Approximately 3.5 percent of the nonmetro South's population and 2.9 percent of the metro South's population in 1977 were children in low-income, female-headed families, the basic target group for AFDC. Nationally, only 2.6 percent of the population were poor children in female-headed families. Despite high target populations, Southern AFDC payments averaged $22 per capita in nonmetro areas and $24 in metro areas in 1977, less than half the national average of $44. State administration of AFDC explains AFDC's low per capita payments in the South. Southern states have typically established low benefit levels. (p. 13)

General Assistance (GA). These programs are funded entirely at the state level, local level, or both. They provide cash or in-kind assistance to poor people who are ineligible for categorical federal assistance programs. People ineligible for federal programs include: nonaged singles, childless couples, two-parent families, and people not sufficiently disabled to be covered by SSI. Vinson and Jesberg's study found that GA benefits exhibited great urban and rural variance in both program coverage and benefit level.

Food Stamps (FS). Begun in 1964 as a program to stabilize and support farm commodity prices, Food Stamps became a $6.5 billion public assistance program by 1979. The Food Stamp Program is federally supported and based

solely on income level and family size. For this reason both rural and urban residents have equal access to the program. The 1977 Food Stamp Act made several revisions in the Food Stamp Program. Probably the most significant was the elimination-of-the-purchase requirement (EPR). Prior to 1977 participants in the program would purchase food stamps which had a face value higher than the purchase price (for example, the participant received a bonus value from using the stamps for food purchases). After the EPR, food stamps were distributed free to eligible participants. As Bryant, Bawden, and Saupe point out, unless there is "stamp illusion," the design of the program after EPR is almost identical to a cash income maintenance program from the viewpoint of the participants. Indeed, the EPR did increase the participation in the Food Stamp Program. The second report to Congress on the effects of the 1977 legislation by the Food and Nutrition Service (USDA, 1981) states:

> A significant portion of the new participants came from rural areas, where the participation rate has historically been lowest. Although this finding was reported earlier, it is now possible to estimate its magnitude more precisely. Between November 1978 (just prior to EPR) and November 1979, participation in the smallest Food Stamp program areas (which are mostly in rural locations) increased 55 percent. Over the same period, participation in the largest (mostly urban) areas grew by only 11 percent. In absolute numbers, too, rural areas outstripped urban areas. Of the total increase in participation nationwide during the twelve months after EPR, 42 percent occurred in the smallest project areas, while 20 percent occurred in the largest areas. (p. ii)

The increase in rural participation in the Food Stamp Program raises the question: "Why did many rural residents not participate in the program prior to the EPR?" This can be answered by theorizing that there were three types of rural residents not participating in the program: (a) those that could not afford to purchase the food stamps; (b) those that did not know that the program existed; (c) those affected by a "travel barrier." This barrier may have been erected simply because of the distance a rural resident would travel to get to a food stamp distribution center or store that would accept food stamps. Indeed, in the eyes of some rural residents, the value of both the time and expense of travel may have acceded the bonus value of the food stamps. When the cost of the actual

stamps went to zero, the bonus value (now equal to the full face value of the stamps) probably increased dramatically relative to the travel and other costs. It is clear that more research should be undertaken on the operation of the Food Stamp Program after EPR.

Welfare Reform

Much of the recent work on transfer payments in rural areas (Seninger and Smeeding, 1981; Bawden, 1977; and Vinson and Jesberg, 1978), concludes that a restructuring of the transfer payment programs is in order. Bawden (1977) proposes that an income maintenance program would better serve rural residents because it would not exclude poor, nonelderly male-headed households. Studies on a particular welfare reform proposal by Pryor (1979) and Carlin, Hendricks, and Christian (1977) found that, compared with the current public assistance programs, the nonmetropolitan poor would gain significantly from the adoption of a national uniform income maintenance program. Vinson and Jesberg (1978) provide a more general criteria for evaluating welfare reforms, stating:

> Need, not category, should be the criteria for any equitable and adequate reform of the public assistance system. The nationwide standard for eligibility should be based on need (measurements of income and assets) rather than the categorical classifications now applied to AFDC, AFDC-UF, and SSI. (p. 6)

As we have discussed, the urban-rural inequities in the current transfer payment system occur because the categories of eligibility for a number of programs are too narrow to include both the working poor and poor, nonelderly male-headed households. It is also clear that this urban-rural disparity stems from the state-to-state variation in program organization and implementation. There is little question that a more equitable system of distributing transfer benefits could be designed. However, the political viability of any sweeping reform of the current public tranfer payment system is, as always, uncertain.

Summary

In this section I have discussed the effectiveness of the current transfer payment programs in reaching the rural poor. From the discussion it is clear that many of the current transfer programs only account for the demographic differences between rural and urban poor by excluding many rural residents. Any reforms of these programs should account for these demographic differences. The adoption of a universal income maintenance program has been investigated by the authors cited above and by Palmer and Pechman (1978), and by Bawden and coauthors of the Institute for Research on Poverty at the University of Wisconsin (1976). Indeed, the Food Stamp Program after the EPR operates as a limited income maintenance program, so further research on such programs could be undertaken by evaluating the current Food Stamp program. The adoption of an income maintenance program, specifically in rural areas, would require greater knowledge of the assets and wealth of the rural poor. Previously in this paper we have made note of the lack of current research on this subject.

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INCOME DISTRIBUTION, POVERTY, NATURAL RESOURCES, AND PUBLIC POLICIES: CONCEPTUAL AND RESEARCH ISSUES

Comments on the Emery N. Castle and Mark Goldstein Paper

by Philip M. Raup

The authors are to be congratulated on the breadth of the conceptual formulation of the problems they attack in this wide-ranging paper. Given its scope, it is understandable that they have been unable to develop in detail many of the issues they raise. The comments that follow are intended to suggest directions that further work on the subject matter of the paper could profitably take.

It may be helpful to introduce these remarks with a brief review of some basic characteristics of our data on land tenure in rural areas that need particular emphasis, because they run counter to many conventional beliefs:

1. --The proportion of the area of farmland operated by those who own it is about as high today as it has been at any time in the 20th century.

   --The proportion operated by full owners (who rent in no additional land) is apparently at or near an all-time low.

   --The proportion operated by full tenants is also at or near an all-time low.

   --Farm operation by part owners-part tenants is at an all-time high.

   --Full-owner operation has declined, but owner-operatorship is near its all-time high measured in acres.
2. We have a much smaller number of farm operating units, but a sharply higher number of land ownership units. Farm operating units are more concentrated; ownership of farm land is more dispersed.
3. Because of the heavy off-farm migration since 1950, we now have what is probably an all-time high of farmland ownership by non-farm people, with rural roots.

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4. For every person in the farm population, I estimate that we now have three persons in the non-farm population with roots in farming.

The Castle-Goldstein paper gives repeated evidence of the extent to which we are still preoccupied with a body count in measuring economic or social significance. Agriculture, forestry, mining, and fishing are defined as "declining industries," with decline measured by the proportion of the labor force employed. It is pointed out later in the paper that this is a tautological statement that contributes little to analysis. We measure progress by the presence of declining industries, with decline used as a proxy for efficiency in the use of labor. If use of capital was the measure of significance, then the sense in which agriculture, forestry, mining, and fishing are declining would need to be revised. A body count is not the only relevant measure, and the pejorative connotation of the phrase "declining industry" needs to be reexamined. One prominent policy conclusion to be derived from the paper is that we can measure progress in our attack on poverty by the multiplication of declining industries.

A major theme that appears throughout the paper is introduced by the following sentence: "A loss in U.S. competitive advantage can increase unemployment in rural areas perhaps as much or more than in central cities...." This underlines a massive shift in the structure of the U.S. economy over the past two decades and especially since 1973: rural America has entered the world market. This is dramatized by the increase in the percentage of rural communities affected by trends in agricultural export markets. It is scarcely less significant in rural areas dependent on fossil fuel extraction, other minerals, or forestry. Since the development of natural resources is overwhelmingly a rural pursuit, the entry of rural American into the world market is perhaps the most important single fact that should govern our future plans for resource development. We can also note that inflation control through interest rates has been an especially heavy burden on rural resource development.

The significance of world market dependency is acknowledged at several points in the paper, but the argument on this point is not sharply focused. it may be no exaggeration to observe that the exchange rate of the dollar in world financial markets is replacing parity in domestic farm prices as the most important indicator of the well-being of rural regions in the United States.

A second major theme of the paper concerns the low rate of net social return that has been obtained from past efforts at large-scale resource development. In this context, it is instructive to cite a comment made to me several years ago by one of the officials involved in polder reclamation in the Zuyder Zee, or Ijsselmeer, in the Netherlands: "If we had been guided by cost-benefit analysis for the last 400 years, there would be no Netherlands." This suggests that conclusions regarding the overall economic and social consequences of large, capital-intensive resource development projects need to be interpreted in a very broad framework. It may not be possible to include some of the key dimensions within the conventional accounting procedures used to compute net social rates of return on the investment.

It may also restrict the analysis if the results of investments in resources are judged in terms of stated objectives. An outstanding example is the Interstate and Defense Highway Program. There can be little doubt that the major effect of the program has been on the relocation of economic activity, and this was not among the state objectives.

Referring to the national benefits of natural resource investments, the authors conclude that "Generally speaking, such investments have not yielded good returns to the nation." This is a very sweeping generalization. It is demonstrably clear that for many projects, "the political pressures have been such that benefit-cost analysis has not been rigorously applied." But to condemn natural resource investments on these grounds may be assigning greater accuracy to benefit-cost analysis than that tool merits. In revision, the authors may appropriately be invited to reexamine their conclusions on this point.

The significance of rent seeking in its most basic sense is downplayed in the Castle-Goldstein paper. It seems probable that one of the major reasons for the turnaround in rural population growth in the past decade lies in the hope for capital gain.

The rural areas have become a "frontier," together with urban residential areas, in that the prospect for capital gain has again become a major attraction for land ownership, as it was in the era of the pioneer frontier. The tentative conclusion of the Castle-Goldstein paper is that the importance of rent in income distribution has declined. This is one of the propositions advanced in the paper that seems most in need of verification.

The argument incorporating economies of scale also needs further consideration. The interpretation of data from the article by Luther Tweeten in SCIENCE of March 4, 1983, is compromised by the use of relatively small and limited-resource farms as a basis for comparison. These are not the models of production efficiency or environmental protection that are in the minds of those who are concerned about the expansion of very large farms in U.S. agriculture. The comparison that is needed is not between large farms and farms with annual sales of under $40,000; the relevant comparison is between farms with sales in the $40,000 to $100,000 range and very large farms, for example, with gross sales of over $200,000. By posing a straw man in the form of an assumed structural policy goal based on commercial farms at the lowest end of the size scale, Tweeten has done a disservice to the judicious discussion of this sensitive issue.

In the major corn, soybean, wheat, sorghum, and cotton areas, it is not probable that the modal farms can command 90 percent or more of any production economies to be achieved through farm size. The search for production efficiencies through increases in farm size is rapidly diminishing as a fruitful area for the continued investment of scarce research funds. What is now needed is to explore the costs, in monetary and nonmonetary terms, of achieving the remaining 5 or 10 percent of production efficiencies that might be available through further increases in farm size. This research focus necessarily shifts attention from the production economies of particular farms to the more comprehensive issues of community and sectoral social, political, and economic good health. Rigidity, loss of resiliency, price insensitivity, and technological obsolescence are now visible as future problems in American agriculture. This prospect is all the more sobering in view of the fact that these are the very areas in which agriculture has made outstanding contributions to the recent history of American economic development.

An area of analysis that is scarcely touched upon in the paper concerns the rapid growth of jobs in the service sector in rural areas. Many of these are resource-related, and are supplanting direct employment in agriculture or in resource-extractive industries as the major source of rural jobs. The locational consequences of the revolution in communica-

tions that is already underway seem likely to parallel the upheaval that was introduced by the Interstate Highway Program.

Rural service-sector employment may well become one of the major growth sectors in the national labor market. The preference for life-styles associated with relatively small cities or rural areas is most easily achieved by those whose service-sector jobs enable them to work out of their homes. This tends to attract those whose incomes are above the average for service-sector employment. The most important point to note in this connection is that the much-discussed resumption of population growth in rural areas does not typically involve the poor.

One final point the authors may wish to expand in their paper concerns the institutional constraints that have developed in labor markets in the United States. The effect of normative wage pricing policies has often been to rob areas with low costs of living of their comparative advantage. This is especially true in rural labor markets. Laws setting minimum wages and fixing the hours and conditions of work are, in effect, price support measures benefiting those who are employed with above-average labor income. These laws prevent areas with low-cost advantages from attracting industries and activities now located in areas with high labor costs.

Labor legislation, in this view, is of great significance for rural areas. Together with the exchange rate of the dollar in foreign financial markets, these two nonrural dimensions of our current economic life may be the dominant variables in future rural resource development.